

Abstract Submitted  
for the DFD07 Meeting of  
The American Physical Society

**Dynamic simulation of chorded mitral valve in a left ventricle using an immersed boundary method**<sup>1</sup> XIAOYU LUO, University of Glasgow, MIN YIN, Xi'an Jiaotong University, CHUNLEI LIANG, University of Glasgow, TIEJUN WANG, Xi'an Jiaotong University, PAUL WATTON, University of Oxford — We use an immersed boundary model to investigate the dynamic behaviour of a chorded mitral prosthesis placed within a left ventricle under physiological flow conditions. *In vivo* magnetic resonance images of the left ventricle are used to create a numerical ventricle model. The motion of the ventricle model is prescribed during a cardiac cycle. Fluid-structure interaction simulations are carried out to test the performance of the mitral valve in a more realistic physiological environment. These simulations enable us to assess the effect of the ventricle motion, especially its flow vortex structure, on the function of the chorded mitral valve.

<sup>1</sup>British Heart Foundation and The Royal Academy of Engineering

Xiaoyu Luo  
University of Glasgow

Date submitted: 25 Jul 2007

Electronic form version 1.4